ITEM 92 FY94
04DS1
9 September 1992

PURCHASE DESCRIPTION

METER, NOISE FIGURE

NFONN-D

1.0 GENERAL This procurement requires a solid-state noise figure meter capable of making accurate noise figure and gain/loss measurements on any receiving system and/or any two-port device in the frequency range of 10 MHz to 18 GHz with IF down conversion to a frequency range of 10 MHz to 1600 MHz.

2.0 CLASSIFICATION The equipment shall meet the requirements of MIL-T-28800( ), Type III, Class 5, Style E, Color R for Navy shipboard, submarine, and shore applications with the following modifications and exceptions:

a. The relative humidity requirement is limited to 95% non-condensating.

b. The operating and non-operating altitude requirements are not invoked.

c. The Electromagnetic Interference requirements of MIL-T-28800( ) are limited to CE01, CE03, CS01, CS02 (0.05 to 100 MHz), CS06, RE01 (back panel search excluded), RE02 (14 kHz to 10 GHz), and RS03.

3.0 OPERATIONAL REQUIREMENTS The equipment shall be capable of measuring and directly indicating both noise figure and gain/loss in dB within the specifications and accuracies contained herein.

3.1 Frequency: {F = Tuned frequency}

3.1.1 Range: Tunable at least from 10 MHz to 1600 MHz
3.1.1.1 RF Input Connector: Type-N female
3.1.1.2 VSWR: < 1.7

3.1.2 Bandwidth: 4 - 5 MHz (nominal)

3.1.3 Tuning Accuracy [10˚C to 40˚C]
< ±(1% of F + 1 MHz) [F < 500 MHz]
< ±6 MHz [F > 500 MHz]

3.1.4 Display: Digital readout
3.1.4.1 Resolution: At least 1 MHz

3.1.5 Frequency Resolution: At least 1 MHz

3.2 Measurement Range: (F = Noise Figure, Y = Y factor, T_e = Effective Temperature)

3.2.1 Noise Figure (NF): At least 0 to 25 dB (with automatic second stage correction)
3.2.1.1 Resolution: At least 0.01 dB
3.2.1.2 Instrumentation Accuracy: < ±0.15 dB [ENR 14 to 16]
3.2.1.3 Display: F (dB) / Y (dB) / T_e

3.2.2 Gain/Loss (G/L): At least -20 to +40 dB
3.2.2.1 Resolution: At least 0.1 dB
3.2.2.2 Accuracy: < ±0.25 dB

3.3 Output signals

3.3.1 Noise source drive voltage: 28 ±1 V (BNC female)

3.3.2 Recorder outputs
3.3.2.1 X-axis: At least 0 to 5 V nominal (BNC female)
3.3.2.2 Y-axis: At least 0 to 5 V nominal (BNC female)
3.3.2.3 Z-axis: TTL levels (BNC female)
[pen lift when using X-Y plotter; blanking with oscilloscope]

3.4 Noise Source (f = Measurement frequency)

3.4.1 Drive Voltage: 28.0 ±0.1 V
3.4.1.1 Connector: BNC female

3.4.2 Frequency Range: 10 MHz to 18 GHz (one device)

3.4.3 ENR: At least 12 dB {uncertainty < ±0.4 dB worst case} [f < 18 GHz]
3.4.3.1 Calibration data of ENR vs freq supplied for each noise source
3.4.3.2 Number of data points: > 10 (across range of noise source) [f < 18 GHz]

3.4.4 Maximum SWR: < 1.3 [f < 18 GHz]

4.0 GENERAL REQUIREMENTS

4.1 Power Source: 115 or 230 Vac ±10%, single phase 60 Hz ±10%, less than 200 VA

4.2 Lithium Batteries: Per MIL-T-28800, lithium batteries are prohibited without prior authorization. Requests for approving the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.3 Dimensions: The total volume shall not exceed 29,170 cm^3 (1,780 in^3).

4.4 Weight: The overall weight shall be nominally 15.9 kg (35 lb).

4.5 Calibration Interval: The calibration interval shall be 12 months minimum. The equipment shall be within all accuracy requirements specified herein, with a 72% or greater confidence factor following a calibration interval of 12 months.

4.6 Remote Operation: The unit will be capable of remote operation via IEEE-488( ) bus interface. It shall operate as a talker or listener such that all functions except the power on/off switch are controllable, and shall have as a minimum the following subset of GPIB commands: AH1, SH1, T6, L4, SR1, RL1, PP0, DC1, DT1.